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OMEGA NORWAY ANTENNA SYSTEM CHARACTERISTICS: MODIFICATION AND V--ETC(U)
MAY 78 A N SMITH, J C HANSELMAN N00123-75-C-0328
UNCLASSIFIED NOSC-TR-246-VOL-2 NL

1 OF 2
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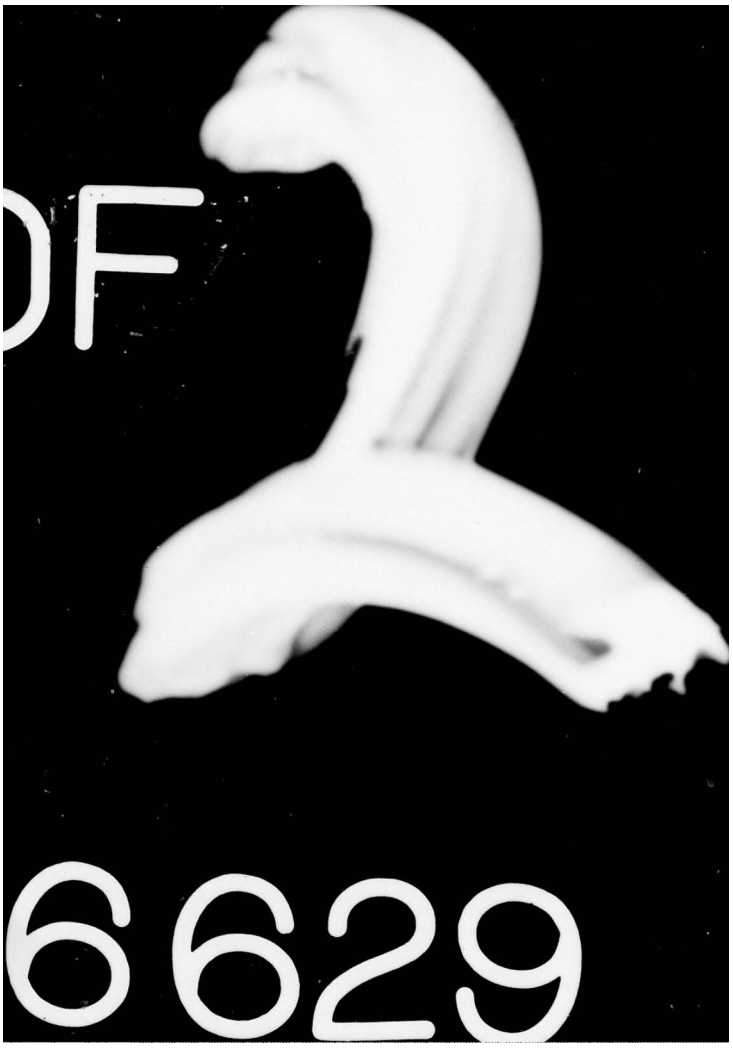
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(6)

OMEGA NORWAY ANTENNA SYSTEM CHARACTERISTICS: MODIFICATION AND VALIDATION TESTS

Volume 2. Data Sheets

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NAVAL OCEAN SYSTEMS CENTER
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AN ACTIVITY OF THE NAVAL MATERIAL COMMAND

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Commander

HL BLOOD
Technical Director

ADMINISTRATIVE INFORMATION

Electronic measurements were performed on the Bratland Omega Antenna System during the months of July and August 1977. The work was performed under NOSC project MP01537B10 with Megatek as contractor under NOSC Technical Agreement 7220-90, Contract N00123-75-C-0328.

Volume 1 of NOSC TR 246 is the report proper. Volume 2 contains data sheets. Volume 3 is the test plan for base impedance. Volume 4 is the test plan for field intensity measurements.

Released by
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Volume 1 is the report proper. Volume 2 contains data sheets. Volume 3 is the test plan for base impedance. Volume 4 is the test plan for field intensity measurements.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Omega vlf navigation system
Antennas – configuration
Monopole antenna
Measurements – electrical
Radiation resistance – efficiency

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Electronic measurements were performed on the Bratland Omega Antenna System during the months of July and August 1977. The work was performed under NOSC project MP01537B10 with Megatek as contractor under NOSC Technical Agreement 7220-90, Contract N00123-75-C-0328.

The antenna height had been significantly lowered in 1975, therefore tests were conducted on antenna performance in three configurations, so that a curve of performance for each frequency of operation is now available as a function of antenna span height. A determination of geometry by means of an optical

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survey was carried out by NOSC in the period 21 through 25 July 1977. Reference data for future comparison, in the event the antenna spans are raised, are thus available.

The electrical height of the antenna is 205 meters for 10.2 kHz when the span is in the so-called 1975 or intermediate elevation in which spans 1 and 3 are respectively paid out 14 and 10½ turns from the "high" or 1973 position. The effective height varies directly as the mean span height, so that the percent increases are the same for electrical and geometrical height. For the 1973 position the effective height is 229 meters. There is a small frequency variation which is very nearly proportional to the fifth root of the frequency ratio.

The antenna system efficiency in the 1975 configuration is 5.9%, and in the 1973 configuration is 7.3%; therefore with 150 kW antenna system input power the station will be able to radiate 10 kW when the spans are raised. For this mode of operation the spans are operating at about 70% of their design voltage limit or less; full 10 kW radiated can be obtained by raising the spans back to the full 1973 height.

TABLE OF CONTENTS

INTRODUCTION

During the performance of modification and validation tests at OMEGA NORWAY, data and all pertinent information collected was recorded on appropriate data sheets. This information was later transcribed as necessary to data sheets designed to facilitate analysis and computation of desired operating parameters.

These data and computation sheets are presented herewith in rough form for future reference.

DATA SHEET 1

APPARENT CAPACITANCE

16 JULY 1977
Date

1. Frequency 10199 Hz.

2. Decade Capacitor

Indicated Reading: 0 . 0366 µF.

Corrected Values : 0.0X 0 . 030105 µF.

(Table 1) 0.00X 0 . 006026 µF.

0.000X 0 . 000604 µF.

Residual Capacitance: CANCELLED BY WIRING CAP. 0 . ——— µF.
Add

TOTAL Decade Capacitance: 0 . 036735 µF.

3. Variable Capacitor: 0 . 000374 µF.
Add

4. Apparent Capacitance, $C_{app.}$: 0 . 037109 µF.
(Includes Exit Bushing)

5. Reactance, X_C (Calculated) 421 Ohms

6. Exit Bushing Capacitance 0 . 000150 µF.
(Manufacturer's Data) Subtract

7. Apparent Capacitance, $C_{app.}$' 0 . 036959 µF.
(Antenna only)

DATA SHEET 1

APPARENT CAPACITANCE

16 July 1977
Date

1. Frequency 11332 Hz.

2. Decade Capacitor

Indicated Reading: 0 . 0375 µF.

Corrected Values : 0.0X 0 . 030105 µF.

(Table 1) 0.00X 0 . 007027 µF.

0.000X 0 . 000502 µF.

Residual Capacitance: CANCELLED BY WIRING CAP. 0 . ——— µF.
Add

TOTAL Decade Capacitance: 0 . 037634 µF.

3. Variable Capacitor: 0 . 000486 µF.
Add

4. Apparent Capacitance, $C_{app.}$: 0 . 038120 µF.
(Includes Exit Bushing)

5. Reactance, X_C (Calculated) 368 Ohms

6. Exit Bushing Capacitance 0 . 000150 µF.
(Manufacturer's Data) Subtract

7. Apparent Capacitance, $C_{app.}$, 0 . 037970 µF.
(Antenna only)

DATA SHEET 1

APPARENT CAPACITANCE

16 JULY 1977
Date

1. Frequency 12101 Hz.

2. Decade Capacitor

Indicated Reading: 0 . 0380 µF.

Corrected Values : 0.0X 0 . 030105 µF.

(Table 1) 0.00X 0 . 008034 µF.

0.000X 0 . 0 µF.

Residual Capacitance: CANCELLED BY WIRING CAP. 0 . ——— µF.
Add

TOTAL Decade Capacitance: 0 . 038139 µF.

3. Variable Capacitor: 0 . 000771 µF.
Add

4. Apparent Capacitance, $C_{app.}$: 0 . 038910 µF.
(Includes Exit Bushing)

5. Reactance, X_C (Calculated) 338 Ohms

6. Exit Bushing Capacitance 0 . 000150 µF.
(Manufacturer's Data) Subtract

7. Apparent Capacitance, $C_{app.}$, 0 . 038760 µF.
(Antenna only)

DATA SHEET 1

APPARENT CAPACITANCE

16 JULY 1977
Date

1. Frequency 12349 Hz.

2. Decade Capacitor

Indicated Reading: 0 .0380 µF.

Corrected Values : 0.0X 0 .030105 µF.

(Table 1) 0.00X 0 .008034 µF.

0.000X 0 .0 µF.

Residual Capacitance: CANCELLED BY WIRING CAP. 0 . ——— µF.
Add

TOTAL Decade Capacitance: 0 .038139 µF.

3. Variable Capacitor: 0 .001050 µF.
Add

4. Apparent Capacitance, $C_{app.}$: 0 .039189 µF.
(Includes Exit Bushing)

5. Reactance, X_C (Calculated) 329 Ohms

6. Exit Bushing Capacitance 0 .000150 µF.
(Manufacturer's Data) Subtract

7. Apparent Capacitance, $C_{app.}$, 0 .039039 µF.
(Antenna only)

DATA SHEET 1

APPARENT CAPACITANCE

16 JULY 1977
Date

1. Frequency 13597 Hz.

2. Decade Capacitor

Indicated Reading: 0 .0400 µF.

Corrected Values : 0.0X 0 . 040245 µF.

(Table 1) 0.00X 0 . 0 µF.

0.000X 0 . 0 µF.

Residual Capacitance: CANCELLED BY WIRING CAP. 0 . ——— µF.
Add

TOTAL Decade Capacitance: 0 . 040245 µF.

3. Variable Capacitor: 0 . 000576 µF.
Add

4. Apparent Capacitance, $C_{app.}$: 0 . 040821 µF.
(Includes Exit Bushing)

5. Reactance, X_C (Calculated) 287 Ohms

6. Exit Bushing Capacitance 0 . 000150 µF.
(Manufacturer's Data) Subtract

7. Apparent Capacitance, $C_{app.}$, 0 . 040671 µF.
(Antenna only)

DATA SHEET 2

ANTENNA SYSTEM RESISTANCE

R_{as}

22 JULY 1977
Date

1. Frequency 10191 Hertz

2. Fixed Resistor, Z (Impedance) 0.22 μH 1.001 Ohms

3. $R_{as} = \frac{E_1 Z}{E - E_1}$ (Ohms)

4. Voltage Readings:

Trial 1
E = 3.019 Volts
E_1 = 1.695 Volts
$R_{as(1)}$ = 1.216 Ohms

Trial 2
E = 2.767 Volts
E_1 = 1.518 Volts
$R_{as(2)}$ = 1.217 Ohms

Trial 3
E = 2.765 Volts
E_1 = 1.516 Volts
$R_{as(3)}$ = 1.215 Ohms

Trial 4
E = 2.763 Volts
E_1 = 1.514 Volts
$R_{as(4)}$ = 1.214 Ohms

Trial 5
E = ____ . ____ Volts
E_1 = ____ . ____ Volts
$R_{as(5)}$ = ____ . ____ Ohms

5. Average R_{as} = 1.216 Ohms

ANTENNA AT 1975 HEIGHT.
WET & RAINY.

DATA SHEET 2

ANTENNA SYSTEM RESISTANCE

R_{as}

22 JULY 1977
Date

1. Frequency 11091 Hertz

2. Fixed Resistor, Z (Impedance) 0.22 μH 1.001 Ohms

3. $R_{as} = \frac{E_1 Z}{E - E_1}$ (Ohms)

4. Voltage Readings:

Trial 1
E = 6 . 415 Volts
E_1 = 3 . 611 Volts
$R_{as(1)}$ = 1 . 289 Ohms

Trial 2
E = 7 . 912 Volts
E_1 = 4 . 454 Volts
$R_{as(2)}$ = 1 . 289 Ohms

Trial 3
E = 3 . 161 Volts
E_1 = 1 . 778 Volts
$R_{as(3)}$ = 1 . 287 Ohms

Trial 4
E = 8 . 123 Volts
E_1 = 4 . 572 Volts
$R_{as(4)}$ = 1 . 289 Ohms

Trial 5
E = 5 . 745 Volts
E_1 = 3 . 234 Volts
$R_{as(5)}$ = 1 . 289 Ohms

5. Average R_{as} = 1 . 289 Ohms

ANTENNA AT 1975 HEIGHT.
WET & RAINY.

DATA SHEET 2

ANTENNA SYSTEM RESISTANCE

R_{as}

22 JULY 1977
Date

1. Frequency 11355 Hertz

2. Fixed Resistor, Z (Impedance) 0.22 μH 1.001 Ohms

3. $R_{as} = \frac{E_1 Z}{E - E_1}$ (Ohms)

4. Voltage Readings:

Trial 1
E = 6.512 Volts
E_1 = 3.693 Volts
$R_{as(1)}$ = 1.312 Ohms

Trial 2
E = 6.523 Volts
E_1 = 3.695 Volts
$R_{as(2)}$ = 1.308 Ohms

Trial 3
E = 3.852 Volts
E_1 = 2.185 Volts
$R_{as(3)}$ = 1.312 Ohms

Trial 4
E = 8.153 Volts
E_1 = 4.618 Volts
$R_{as(4)}$ = 1.308 Ohms

Trial 5
E = 6.376 Volts
E_1 = 3.615 Volts
$R_{as(5)}$ = 1.311 Ohms

5. Average R_{as} = 1.310 Ohms

ANTENNA AT 1975 HEIGHT.
WET & RAINY.

DATA SHEET 2

ANTENNA SYSTEM RESISTANCE

R_{as}

22 JULY 1977
Date

1. Frequency 12103 Hertz

2. Fixed Resistor, Z (Impedance) 0.22 μH 1.001 Ohms

3. $R_{as} = \frac{E_1 Z}{E - E_1}$ (Ohms)

4. Voltage Readings:

Trial 1
E = 6.626 Volts
E_1 = 3.834 Volts
$R_{as(1)}$ = 1.375 Ohms

Trial 2
E = 8.537 Volts
E_1 = 4.936 Volts
$R_{as(2)}$ = 1.372 Ohms

Trial 3
E = 4.964 Volts
E_1 = 2.874 Volts
$R_{as(3)}$ = 1.377 Ohms

Trial 4
E = 8.491 Volts
E_1 = 4.910 Volts
$R_{as(4)}$ = 1.373 Ohms

Trial 5
E = 9.805 Volts
E_1 = 5.672 Volts
$R_{as(5)}$ = 1.374 Ohms

5. Average R_{as} = 1.374 Ohms

ANTENNA AT 1975 HEIGHT.
WET & RAINY

DATA SHEET 2

ANTENNA SYSTEM RESISTANCE

R_{as}

22 JULY 1977
Date

1. Frequency 13627 Hertz

2. Fixed Resistor, Z (Impedance) 0.22 μH 1.001 Ohms

3. $R_{as} = \frac{E_1 Z}{E - E_1}$ (Ohms)

4. Voltage Readings:

Trial 1
E = 6.985 Volts
E_1 = 4.208 Volts
$R_{as(1)}$ = 1.517 Ohms

Trial 2
E = 7.019 Volts
E_1 = 4.226 Volts
$R_{as(2)}$ = 1.515 Ohms

Trial 3
E = 6.417 Volts
E_1 = 3.865 Volts
$R_{as(3)}$ = 1.516 Ohms

Trial 4
E = 1.931 Volts
E_1 = 1.165 Volts
$R_{as(4)}$ = 1.523 Ohms

Trial 5
E = 8.654 Volts
E_1 = 5.216 Volts
$R_{as(5)}$ = 1.519 Ohms

5. Average R_{as} = 1.518 Ohms

ANTENNA AT 1975 HEIGHT.
WET & RAINY.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: SEVERAL

1. LOCATION OF MEASUREMENT: SITE NUMBER: TOMMA BENCHMARK

Description: KYRHAUGEN, NEAR ROCK PYRAMID ON NE POINT OF TOMMA

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (−) 3.450 (Inches) ± Dist. to position = Lat. 66 (DD) ° 17 (MM) ' 38 (SS) " (N) N or S

Nearest Lat. Line

12 (DDD) ° 50 (MM) ' ___ (SS) " (+) 1.417 (Inches) ± Dist. to Position = Long. 12 (DDD) ° 52 (MM) ' 25 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 222 °T. Distance: 18.8 km.

DS 4-1

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY

DATE: 30 JULY 1977

SITE NUMBER: I-1

1. LOCATION OF MEASUREMENT:

Description: N60 MARK ON HESTMANNEN - BENCHMARK

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 30 (MM) ' ___ (SS) " (+) 3 . 867 (Inches) = Lat. 66 (DD) ° 32 (MM) ' 39 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

12 (DDD) ° 50 (MM) ' ___ (SS) " (+) 1 . 655 (Inches) = Long. 12 (DDD) ° 52 (MM) ' 51 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 319 ° T.

Distance: 18 . 25 km.

DS 4-2

OMEGA STATION, NORWAY DATE: 30 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: I-2

Description: SUNDÖEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 35 (MM) ' ___ (SS) " (+) 0 . 852 (Inches) = Lat. 66 (DD) ° 35 (MM) ' 35 (SS) " (N) N or S
Nearest Lat. Line ± Dist. to position

12 (DDD) ° 55 (MM) ' ___ (SS) " (+) 0 . 428 (Inches) = Long. 12 (DDD) ° 55 (MM) ' 44 (SS) " (E) E or W
Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 333 ° T. Distance: 21 . 6 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 30 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: I-3

Description: FLATÖEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 40 (MM) ' ___ (SS) " (−) 0 . 970 (Inches) = Lat. 66 (DD) ° 39 (MM) ' 20 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 00 (MM) ' ___ (SS) " (−) 0 . 408 (Inches) = Long. 12 (DDD) ° 59 (MM) ' 18 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 345 °T. Distance: 22 . 1 km.

OMEGA STATION, NORWAY

DATE: 30 JULY 1977

1. LOCATION OF MEASUREMENT:

SITE NUMBER: I-4

Description: SVINVÆR (Fjössgaarden)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 45 (MM) ' ___ (SS) " (−) 0.266 (Inches) = Lat. 66 (DD) ° 44 (MM) ' 49 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 10 (MM) ' ___ (SS) " (−) 1.084 (Inches) = Long. 13 (DDD) ° 08 (MM) ' 07 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 359 °T.

Distance: 36.2 km.

DS 4-5

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 30 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: I-5

Description: (BOLGEN) BURSOEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 50 (MM) ' ___ (SS) " (−) 3.108 (Inches) ± = Lat. 66 (DD) ° 47 (MM) ' 52 (SS) " (N) N or S

Nearest Lat. Line — Dist. to position

13 (DDD) ° 10 (MM) ' ___ (SS) " (+) 0.539 (Inches) ± = Long. 13 (DDD) ° 10 (MM) ' 56 (SS) " (E) E or W

Nearest Long. Line — Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 002 ° T. Distance: 41 . 9 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 30 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: I-6

Description: VARK GAARD

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 50 (MM) ' ___ (SS) " (+) 2.010 (Inches) = Lat. 66 (DD) ° 51 (MM) ' 22 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 15 (MM) ' ___ (SS) " (+) 0.166 (Inches) = Long. 13 (DDD) ° 15 (MM) ' 17 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 005 ° T. Distance: 48.6 km.

DS 4-7

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 29 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: II - 1

Description: NGO MARK ON HESTMANNEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 30 (MM) ' ___ (SS) " (+) 3.867 (Inches) ± Dist. to position = Lat. 66 (DD) ° 32 (MM) ' 39 (SS) " (N) N or S

Nearest Lat. Line

12 (DDD) ° 50 (MM) ' ___ (SS) " (+) 1.655 (Inches) ± Dist. to Position = Long. 12 (DDD) ° 52 (MM) ' 51 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 319 °T. Distance: 18 . 25 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 29 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: II-2

Description: LYNGVÆR

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 40 (MM) ' ___ (SS) " (−) 0 . 182 (Inches) ± = Lat. 66 (DD) ° 39 (MM) ' 41 (SS) " (N) N or S

Nearest Lat. Line — Dist. to position

12 (DDD) ° 30 (MM) ' ___ (SS) " (+) 2 . 066 (Inches) ± = Long. 12 (DDD) ° 33 (MM) ' 34 (SS) " (E) E or W

Nearest Long. Line — Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 316 °T. Distance: 37 . 5 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 29 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: II - 3

Description: MYKEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 45 (MM) ' ___ (SS) " (+) 1 . 962 (Inches) = Lat. 66 (DD) ° 46 (MM) ' 20 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

12 (DDD) ° 25 (MM) ' ___ (SS) " (+) 1 . 412 (Inches) = Long. 12 (DDD) ° 27 (MM) ' 27 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 322 ° T. Distance: 49 . 7 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 29 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: III - 1

Description: MÅVÆR

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 25 (MM) ' ___ (SS) " (+) 4.880 (Inches) = Lat. 66 (DD) ° 28 (MM) ' 20 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

12 (DDD) ° 40 (MM) ' ___ (SS) " (+) 0.984 (Inches) = Long. 12 (DDD) ° 41 (MM) ' 41 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 286 °T. Distance: 21 . 1 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY

DATE: 29 JULY 1977

1. LOCATION OF MEASUREMENT:

SITE NUMBER: III-2

Description: LAMMA (NORTH OF TRÆNA)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 30 (MM) ' ___ (SS) " (+) 2 . 295 (Inches) ± Dist. to position = Lat. 66 (DD) ° 31 (MM) ' 34 (SS) " (N) N or S

Nearest Lat. Line

12 (DDD) ° 00 (MM) ' ___ (SS) " (+) 1 . 078 (Inches) ± Dist. to Position = Long. 12 (DDD) ° 01 (MM) ' 51 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 284 °T.

Distance: 51 . 1 km.

DS 4-12

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 27 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: IV-1

Description: MEFJORDSHLNE (HALF-WAY BETWEEN THE TWO ISLANDS)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 10 (MM) ' ___ (SS) " (+) 3.258 (Inches) ± Dist. to position = Lat. 66 (DD) ° 12 (MM) ' 14 (SS) " (N) N or S

Nearest Lat. Line

12 (DDD) ° 50 (MM) ' ___ (SS) " (+) 0.321 (Inches) ± Dist. to Position = Long. 12 (DDD) ° 50 (MM) ' 33 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 210 ° T. Distance: 27.8 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY DATE: 27 JULY 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: IV - 2

Description: YT - LEINES (NE OF SANDNESSJÖEN)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° CC (MM) ' ___ (SS) " (+) 3.097 (Inches) ± Nearest Lat. Line / Dist. to position = Lat. 66 (DD) ° 02 (MM) ' 07 (SS) " (N) N or S

12 (DDD) ° 40 (MM) ' ___ (SS) " (+) 0.070 (Inches) ± Nearest Long. Line / Dist. to Position = Long. 12 (DDD) ° 40 (MM) ' 07 (SS) " (E) E or W

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 207 ° T. Distance: 48 . 0 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-1

Description: GRAAVATNET - ALL READINGS

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° . 25 (MM) ' ___ (SS) " (−) 0 . 876 (Inches) ± = Lat. 66 (DD) ° 24 (MM) ' 24 (SS) " (N) N or S

Nearest Lat. Line — Dist. to position

13 (DDD) ° . 20 (MM) ' ___ (SS) " (+) 1 . 010 (Inches) ± = Long. 13 (DDD) ° 21 (MM) ' 44 (SS) " (E) E or W

Nearest Long. Line — Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 99 °T. Distance: 9 . 4 km.

OMEGA STATION. NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-2A

Description: RAUDSKREDEN – 10.2

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° . 25 (MM) ' ___ (SS) " (−) 0 . 374 (Inches) ± = Lat. 66 (DD) ° : 24 (MM) ' 45 (SS) " (N) N or S

Nearest Lat. Line — Dist. to position

13 (DDD) ° . 25 (MM) ' ___ (SS) " (+) 1 . 030 (Inches) ± = Long. 13 (DDD) ° : 26 (MM) ' 46 (SS) " (E) E or W

Nearest Long. Line — Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° : 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° : 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 94 °T. Distance: 13 . 1 km.

DS 4-16

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY DATE: 1 Aug 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-2B

Description: RAUDSKREDEN - 13.6

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 25 (MM) ' ___ (SS) " (−) 0.942 (Inches) ± Dist. to position = Lat. 66 (DD) ° 24 (MM) ' 22 (SS) " (N) N or S

Nearest Lat. Line

13 (DDD) ° 25 (MM) ' ___ (SS) " (+) 2.506 (Inches) ± Dist. to Position = Long. 13 (DDD) ° 29 (MM) ' 17 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 94 °T. Distance: 15.0 km.

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-2C

Description: RAUDSKREDEN - 11-1/3

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 25 (MM) ' ___ (SS) " (−) 0.258 (Inches) ± Dist. to position = Lat. 66 (DD) ° 24 (MM) ' 50 (SS) " (N) N or S
Nearest Lat. Line

13 (DDD) ° 25 (MM) ' ___ (SS) " (+) 1.633 (Inches) ± Dist. to Position = Long. 13 (DDD) ° 27 (MM) ' 48 (SS) " (E) E or W
Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 93 °T. Distance: 13.8 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY

DATE: 1 AUG 1977

SITE NUMBER: V-2 D

1. LOCATION OF MEASUREMENT:

Description: RAUDSKREDEN - 11-05

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 25 (MM) ' ___ (SS) " (−) 0.538 (Inches) ± Dist. to position = Lat. 66 (DD) ° 24 (MM) ' 38 (SS) " (N) N or S

Nearest Lat. Line

13 (DDD) ° 25 (MM) ' ___ (SS) " (+) 1.760 (Inches) ± Dist. to Position = Long. 13 (DDD) ° 28 (MM) ' 01 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 95 °T.

Distance: 14 . 0 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-2E

Description: RAUDSKREDEN - 10.2 (INBOUND)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 25 (MM) ' ___ (SS) " (−) 0.956 (Inches) ± Dist. to position = Lat. 66 (DD) ° 24 (MM) ' 21 (SS) " (N) N or S

Nearest Lat. Line

13 (DDD) ° 25 (MM) ' ___ (SS) " (+) 0.800 (Inches) ± Dist. to Position = Long. 13 (DDD) ° 26 (MM) ' 22 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 97 °T. Distance: 12 . 9 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-3A

Description: E&D FAGERVOLD - ALL OUTBOUND READINGS.

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 25 (MM) ' ___ (SS) " (−) 2.058 (Inches) = Lat. 66 (DD) ° 23 (MM) ' 36 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

___ (DDD) ° ___ (MM) ' ___ (SS) " ( ) ___ (Inches) = Long. 13 (DDD) ° 35 (MM) ' 00 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

DS 4-21

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 99 °T. Distance: 19.4 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-3.B

Description: ÖB FAGERVOLD - 10.2 (INBOUND)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 25 (MM) ' ___ (SS) " (−) 2.182 (Inches) ± Nearest Lat. Line Dist. to position = Lat. 66 (DD) ° 23 (MM) ' 30 (SS) " (N) N or S

13 (DDD) ° 35 (MM) ' ___ (SS) " (+) 0.585 (Inches) ± Nearest Long. Line Dist. to Position = Long. 13 (DDD) ° 36 (MM) ' 00 (SS) " (E) E or W

DS 4-22

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 99 °T. Distance: 20.2 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY

DATE: 1 AUG 1977

SITE NUMBER: V-4A

1. LOCATION OF MEASUREMENT:

Description: FEMFJELLET – 10.2

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 2.195 (Inches) ± Dist. to position = Lat. 66 (DD) ° 21 (MM) ' 30 (SS) " (N) N or S

Nearest Lat. Line

13 (DDD) ° 45 (MM) ' ___ (SS) " (+) 2.485 (Inches) ± Dist. to Position = Long. 13 (DDD) ° 49 (MM) ' 15 (SS) " (E) E or W

Nearest Long. Line

DS 4-23

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 103 ° T.

Distance: 30 . 5 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: II-4 B

Description: FEMFJELLET – 13.6

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 2.116 (Inches) = Lat. 66 (DD) ° 21 (MM) ' 27 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 45 (MM) ' ___ (SS) " (+) 1.978 (Inches) = Long. 13 (DDD) ° 48 (MM) ' 23 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 103 °T. Distance: 29.9 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY

DATE: 1 AUG 1977

SITE NUMBER: V-4C

1. LOCATION OF MEASUREMENT:

Description: FEMFJELLET - 11-1/3

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 2.111 (Inches) = Lat. 66 (DD) ° 21 (MM) ' 27 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 45 (MM) ' ___ (SS) " (+) 1.761 (Inches) = Long. 13 (DDD) ° 48 (MM) ' 00 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 103 ° T.

Distance: 29.7 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: I-4 D

Description: FEMFJELLET - 11.05 (1)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 2.260 (Inches) ± Dist. to position = Lat. 66 (DD) ° 21 (MM) ' 33 (SS) " (N) N or S

Nearest Lat. Line

13 (DDD) ° 45 (MM) ' ___ (SS) " (+) 2.448 (Inches) ± Dist. to Position = Long. 13 (DDD) ° 49 (MM) ' 11 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 103 °T. Distance: 30 . 5 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-4 E

Description: FEMFJELLET - 11.05 (2)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 2.060 (Inches) = Lat. 66 (DD) ° 21 (MM) ' 24 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 45 (MM) ' ___ (SS) " (+) 1.636 (Inches) = Long. 13 (DDD) ° 47 (MM) ' 48 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 104 °T. Distance: 29 . 5 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY DATE: 1 Aug 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-4F

Description: FEMFJELLET - 11.05 (3) Nose Away.

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 2.000 (Inches) = Lat. 66 (DD) ° 21 (MM) ' 22 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 45 (MM) ' ___ (SS) " (+) 2.788 (Inches) = Long. 13 (DDD) ° 49 (MM) ' 46 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

DS 4-28

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 103 °T. Distance: 31.0 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION. NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: I-4 G

Description: FEUFJELLET — 10.2 (INBOUND)

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 1.010 (Inches) = Lat. 66 (DD) ° 20 (MM) ' 41 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 45 (MM) ' ___ (SS) " (+) 2.392 (Inches) = Long. 13 (DDD) ° 49 (MM) ' 05 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 106 °T. Distance: 30 . 8 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY

DATE: 1 AUG 1977

SITE NUMBER: V - 5 A

1. LOCATION OF MEASUREMENT:

Description: STEINNYR FJELLET – 10.2

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (−) 2.132 (Inches) ± = Lat. 66 (DD) ° 18 (MM) ' 33 (SS) " (N) N or S

Nearest Lat. Line — Dist. to position

13 (DDD) ° 50 (MM) ' ___ (SS) " (+) 0.567 (Inches) ± = Long. 13 (DDD) ° 50 (MM) ' 58 (SS) " (E) E or W

Nearest Long. Line — Dist. to Position

DS 4-30

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 111 ° T.

Distance: 33 . 4 km.

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: I-5B

Description: STEINAIXR FJELLET - 13.6

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (−) 2.506 (Inches) = Lat. 66 (DD) ° 18 (MM) ' 17 (SS) " (N) N or S
Nearest Lat. Line ± Dist. to position

13 (DDD) ° 50 (MM) ' ___ (SS) " (+) 0.820 (Inches) = Long. 13 (DDD) ° 51 (MM) ' 24 (SS) " (E) E or W
Nearest Long. Line ± Dist. to Position

DS 4-31

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 112 °T. Distance: 33.9 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-5C

Description: STEINMYRFJELLET — 11-1/3

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (−) 2.132 (Inches) ± Dist. to position = Lat. 66 (DD) ° 18 (MM) ' 33 (SS) " (N) N or S

Nearest Lat. Line

13 (DDD) ° 50 (MM) ' ___ (SS) " (+) 0.567 (Inches) ± Dist. to Position = Long. 13 (DDD) ° 50 (MM) ' 58 (SS) " (E) E or W

Nearest Long. Line

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 111 °T. Distance: 33.4 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: V-5D

Description: STEINMYRFJELLET - 11.05

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (−) 2.602 (Inches) ± = Lat. 66 (DD) ° 18 (MM) ' 13 (SS) " (N) N or S

Nearest Lat. Line — Dist. to position

13 (DDD) ° 50 (MM) ' ___ (SS) " (+) 1.201 (Inches) ± = Long. 13 (DDD) ° 52 (MM) ' 03 (SS) " (E) E or W

Nearest Long. Line — Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 112 °T. Distance: 34.4 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY

DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT:

SITE NUMBER: V-5E

Description: STEINMYRFJELLET - ON GROUND

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (−) 2.652 (Inches) = Lat. 66 (DD) ° 18 (MM) ' 11 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

13 (DDD) ° 50 (MM) ' ___ (SS) " (+) 1.584 (Inches) = Long. 13 (DDD) ° 52 (MM) ' 42 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 112 °T.

Distance: 34.9 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: VI-1

Description: RELÖEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 20 (MM) ' ___ (SS) " (+) 3.100 (Inches) = Lat. 66 (DD) ° 22 (MM) ' 07 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

12 (DDD) ° 40 (MM) ' ___ (SS) " (+) 0.450 (Inches) = Long. 12 (DDD) ° 40 (MM) ' 46 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 255 ° T. Distance: 21 . 8 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 Aug 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: VI-2

Description: JULÖEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 15 (MM) ' ___ (SS) " (+) 4.052 (Inches) = Lat. 66 (DD) ° 17 (MM) ' 47 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

12 (DDD) ° 30 (MM) ' ___ (SS) " (+) 0.974 (Inches) = Long. 12 (DDD) ° 31 (MM) ' 40 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 244 °T. Distance: 31.1 km.

DATA SHEET 4

RADIO FIELD INTENSITY

SITE LOCATION

OMEGA STATION, NORWAY DATE: 1 AUG 1977

1. LOCATION OF MEASUREMENT: SITE NUMBER: VI - 3

Description: HELLERÖEN

2. GEOGRAPHIC COORDINATES: (Map or Chart Scale. 1 : 50,000)

66 (DD) ° 15 (MM) ' ___ (SS) " (+) 0 . 134 (Inches) = Lat. 66 (DD) ° 15 (MM) ' 05 (SS) " (N) N or S

Nearest Lat. Line ± Dist. to position

12 (DDD) ° 15 (MM) ' ___ (SS) " (+) 1 . 342 (Inches) = Long. 12 (DDD) ° 17 (MM) ' 17 (SS) " (E) E or W

Nearest Long. Line ± Dist. to Position

3. LOCATION OF TRANSMITTING ANTENNA:

Description, if other than tower.

EXIT BUSHING, TOP OF HELIX HOUSE.

Lat. 66 (DD) ° 25 (MM) ' 15 (SS) " (N) N or S

Long. 13 (DDD) ° 09 (MM) ' 10 (SS) " (E) E or W

4. SIGNAL PATH, TRANSMITTER TO RECEIVING SITE:

Azimuth: 244 ° T. Distance: 42 . 9 km.

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

BENCHMARK DATA

DATE: 9 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: TOMMA

Loop Height 80 (~~Ft~~/In.) Tripod X. Helicopter __. K_2 0.99
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1255	10.20	282	34.3		
1254	13.60	282	46.7		
1252	11-1/3	290	39.6		
	11.05				
	Ft				
	10.20				
	13.60				
	11-1/3				
	11.05				
	Ft				
	10.20				
	13.60				
	11-1/3				
	11.05				
	Ft				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

BENCH MARK DATA

DATE: 9 JULY 1977

OMEGA STATION: NORWAY

SITE NUMBER: NGO HESTMANN

Loop Height 80 (Above Surface) (Ft./In.) Tripod X. Helicopter ___. K_2 0.99 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				1975
1141	13.60	284	45.0		LEVEL
11.45	11-1/3	289	36.6		(MID POINT)
	11.05				
	F_t				
1200	10.20	282	33.0		
1158	13.60	283	44.9		
1196	11-1/3	290	36.5		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 14 July 1977

OMEGA STATION: NORWAY SITE NUMBER: TOMMA

Loop Height 80 (Above Surface) (Ft./In.) Tripod X. Helicopter ___. K_2 0.99 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
2314	10.20	278	37.9		1973 Height
2318	13.60	269	49.9		Highest
2316	11-1/3	270	41.9		Level.
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 14 JULY 1977

OMEGA STATION: NORWAY

SITE NUMBER: NGO HESIMAN?

Loop Height 60 (Above Surface) (FF/In.) Tripod X. Helicopter ___. K_2 0.99 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
2245	10.20	277	36.6		1973
2240	13.60	270	49.1		LEVEL.
2246	11-1/3	270	39.0		(HIGHEST)
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 15 JULY 1977

OMEGA STATION: NORWAY

SITE NUMBER: NGO HESTMAN

Loop Height 80 (Above Surface) (~~Ft.~~/In.) Tripod X. Helicopter ___. K_2 0.99 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1258	10.20	307.5	31.9		LOWEST
1254	13.60	307.3	44.0		LEVEL.
1255	11-1/3	309	35.4		-22 SHEAVE
	11.05				TURNS.
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

HELICOPTER CAL.

DATE: 27 July 1977

OMEGA STATION: NORWAY

SITE NUMBER: Tonna

Loop Height 80 (Above Surface) (⫢/In.) Tripod X. Helicopter ___. K_2 0.99 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1142	10.20	26.7	29.2		
1140	13.60	26.7	40.4		
1138	11-1/3	26.8	32.8		
1137	11.05	26.7	32.2		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I-1

Loop Height 1000 (Ft. ~~Hr.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1428	10.20	263	37.9	150	
1431	13.60	265	50.2		
1433	11-1/3	265	39.3		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I-2

Loop Height 1000 (Ft. ~~Im.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1441	10.20	263	30.5	180	
1440	13.60	261	41.6		
1438	11-1/3	261	32.4		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I-3

Loop Height 1000 (Ft. ~~In.~~) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1447	10.20	264	23.4	190	
1448	13.60	262	32.9		
1449	11-1/3	262	25.4		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I-4

Loop Height 1000 (Ft. ~~In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1457	10.20	264	16.6	195	
1456	13.60	262	23.8		
1455	11-1/3	262	19.8		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I - 5

Loop Height 1000 (Ft./In.) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1502	10.20	26.2	19.5	205	
1504	13.60	26.2	19.3		
1506	11-1/3	26.2	16.4		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I-6

Loop Height 1000 (Ft. ~~In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1514	10.20	262	11.4	200	
1513	13.60	262	16.5		
1512	11-1/3	262	12.8		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I-6

Loop Height 3 (Ft. ~~In.~~) (Above Surface) Tripod __. Helicopter X. K_2 1.00 (Loop Factor)

HELICOPTER ON GROUND

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1517	10.20	263	8.9	200	
1518	13.60	262	12.9		
1519	11-1/3	263	10.0		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 30 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: I-6

Loop Height 80 (EST.) (~~Ft.~~/In.) Tripod X. Helicopter __. K_2 0.99
(Above Surface) (Loop Factor)

OUTSIDE LOOP ON GROUND - AWAY FROM HELO.

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1526	10.20	263	9.6	200	
1525	13.60	262	13.8		
1524	11-1/3	263	11.2		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 29 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: II-1

Loop Height 1000 (Ft. ~~In~~.) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
0955	10.20	271	37.7	150	
0950	13.60	271	52.9		
0952	11-1/3	271	41.6		
0954	11.05	271	40.7		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 29 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: II-2

Loop Height 1000 (Ft. ~~M~~) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1005	10.20	270	16.7	150	
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 29 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: II-3

Loop Height 1000 (Ft./~~Ha~~.) (Above Surface) Tripod __. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1034	10.20	271 (EST)	9.1	150	
1036	13.60	271 (EST)	14.6		
1037	11-1/3	271 (EST)	11.6		
—	11.05	271 (EST)	11.3		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

(EST) AVERAGE OF ± 15 MINUTES.

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 29 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: III - 1

Loop Height 1000 (Ft. ~~Em~~.) (Above Surface) Tripod __. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1227	10.20	270	32.7	130	
1228	13.60	271	45.1		
1232	11-1/3	271	36.8		
1234	11.05	270	35.6		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 29 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: III -2

Loop Height 1000 (Ft. ~~/In.~~) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1259	10.20	270	12.6		
1303	13.60	270	17.4		
1308	11-1/3	271	15.4		
1312	11.05	270	14.8		
	F_t				
	10.20				
1305	13.60	270	18.4		
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 27 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: IV-1

Loop Height 1000 (Ft. ~~Mtr.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1331	10.20	267	24.2		
1334	13.60	267	32.4		
1340	11-1/3	268	26.4		
1341	11.05	267	26.1		
	F_t				
1342	10.20	267	23.7		
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 27 JULY 1977

OMEGA STATION: NORWAY SITE NUMBER: IV-2

Loop Height 1000 (Ft. / ~~In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1311	10.20	267	15.1		
1314	13.60	267	19.2		
1317	11-1/3	268	15.3		
1319	11.05	267	14.6		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug 1977

OMEGA STATION: NORWAY SITE NUMBER: V - 1

Loop Height VARIABLE (Above Surface) (Ft. ~~M~~.) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1342	10.20	270	65.0		
1337	13.60	270	75.0	270	
1338	11-1/3	270	72.4		
1340	11.05	270	69.1		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug 1977

OMEGA STATION: NORWAY SITE NUMBER: V-2A

Loop Height VARIABLE (Ft.~~/In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1348	10.20	270	50,8	285	
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug 1977

OMEGA STATION: NORWAY SITE NUMBER: V-2B

Loop Height VARIABLE (Above Surface) (Ft. ~~M~~.) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
1351	13.60	270	63.1	285	
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-2C

Loop Height VARIABLE (Above Surface) (Ft. ~~M~~.) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
1352	11-1/3	270	56.2	285	
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-2D

Loop Height VARIABLE (Ft. ~~Hn~~.) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
	11-1/3				
1355	11.05	270	55.2	285	
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: I-2 E

Loop Height VARIABLE (Ft. ~~In.~~) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1523	10.20	269	54.1	280	
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: I-3A

Loop Height VARIABLE (Ft./In.) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1413	10.20	270	30.1		
1411	13.60	270	41.1		
1409	11-1/3	270	33.5		
1408	11.05	270	31.4		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-3B

Loop Height VARIABLE (Ft. Hn.) Tripod __. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1520	10.20	269	29.5		
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug, 1977

OMEGA STATION: NORWAY SITE NUMBER: I-4A

Loop Height VARIABLE (Ft. ~~M~~.) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1426	10.20	270	20.2	245	
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-4C

Loop Height VARIABLE (Ft./~~In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
1429	11-1/3	270	21.9	265	
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-4D

Loop Height VARIABLE (Above Surface) (Ft. ~~Rn~~.) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
	11-1/3				
1430	11.05	270	22.2	265	
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-4E

Loop Height VARIABLE (Above Surface) (Ft./~~Mt~~.) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
	11-1/3				
1430+?	11.05	270	22.4	265	
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-4F

Loop Height VARIABLE (Ft./~~In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
	11-1/3				
1430+?	11.05	270	25.3	90	NOSE AWAY
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-46

Loop Height VARIABLE (Ft./~~In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	Ias (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1515	10.20	269	19.1	280	
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: I-5A

Loop Height ~800 (Ft. ~~Hn~~.) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1447	10.20	270	184		
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: V-5B

Loop Height ~ 500 (Ft. ~~Hm.~~) (Above Surface) Tripod __. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
1444	13.60	270	23.1		
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug 1977

OMEGA STATION: NORWAY

SITE NUMBER: V-5C

Loop Height ½ 800 (Ft./M.) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
1444	11-1/3	270	20.4		
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: I-5D

Loop Height 2 800 (Ft. ~~In.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
	10.20				
	13.60				
	11-1/3				
1442	11.05	270	19.1		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug 1977

OMEGA STATION: NORWAY SITE NUMBER: V-5E

Loop Height 2 3 (Ft. ~~In.~~) Tripod __. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1451	10.20	270	19.5		ON GROUND
1452	13.60	270	26.3		
?	11-1/3	270	22.0		
?	11.05	270	21.9		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: II-1

Loop Height 1000 (Ft. ~~Hm.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1606	10.20	270	31.3		
1607	13.60	271	41.1		
1608	11-1/3	270	33.5		
1610	11.05	270	31.3		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: VI - 1

Loop Height 3 (Ft. ~~M.~~) Tripod __. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1617	10.20	270	25.6		HELICOPTER
1616	13.60	270	33.9		ON THE
1615	11-1/3	270	27.3		GROUND
1614	11.05	270	26.8		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

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OMEGA NORWAY ANTENNA SYSTEM CHARACTERISTICS: MODIFICATION AND V--ETC(U)
MAY 78 A N SMITH, J C HANSELMAN N00123-75-C-0328
UNCLASSIFIED NOSC-TR-246-VOL-2 NL

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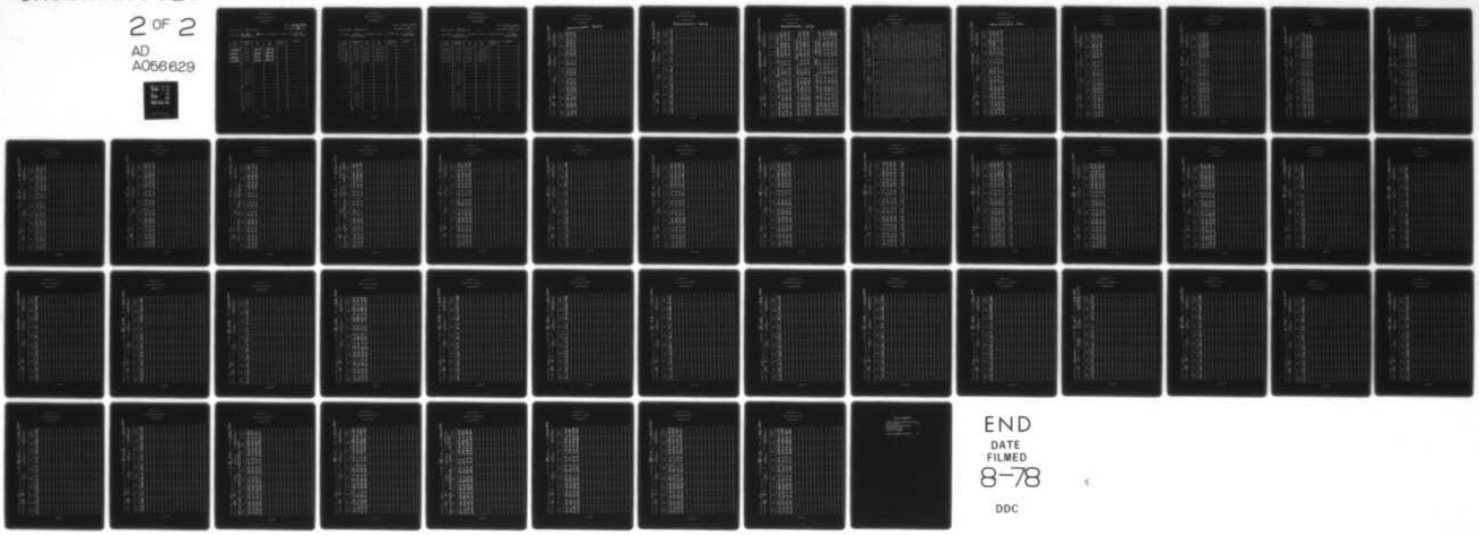

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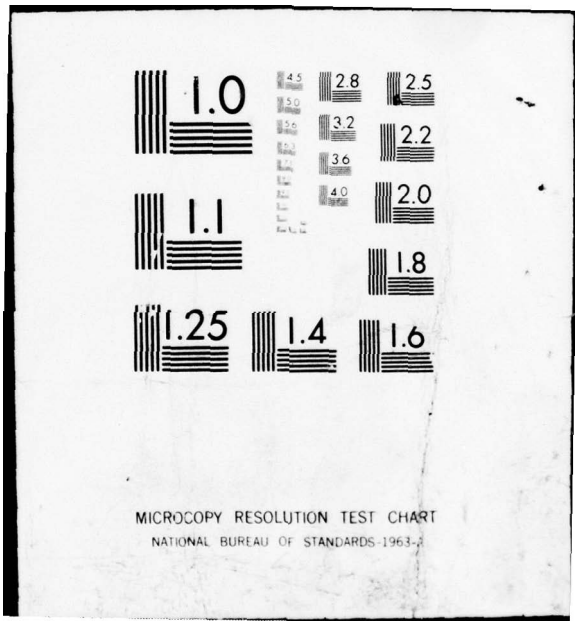
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1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 AUG 1977

OMEGA STATION: NORWAY SITE NUMBER: VI-1

Loop Height ≈ 80 (Above Surface) (≡/In.) Tripod X. Helicopter ___. K_2 0.99 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1620	10.20	269	28.2		
1621	13.60	269	37.4		
1623	11-1/3	271	30.4		
1624	11.05	270	29.8		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug 1977

OMEGA STATION: NORWAY SITE NUMBER: VI - 2

Loop Height 1000 (Ft. ~~Hn~~.) (Above Surface) Tripod ___. Helicopter X. K_2 1.00 (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1641	10.20	271	22.3		
1639	13.60	271	30.7		
1638	11-1/3	271	24.4		
1636	11.05	271	24.7		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 5

RADIO FIELD INTENSITY

MEASUREMENTS

DATE: 1 Aug 1977

OMEGA STATION: NORWAY SITE NUMBER: VI-3

Loop Height 1000 (Ft. ~~Hr.~~) Tripod ___. Helicopter X. K_2 1.00
(Above Surface) (Loop Factor)

TIME (Local)	FREQUENCY (kHz)	I_{as} (A)	E_g (mV)	HEADING (Mag.)	COMMENT
1650	10.20	271	15.3		
1652	13.60	271	20.9		
1653	11-1/3	271	17.7		
1655	11.05	271	16.6		
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				
	10.20				
	13.60				
	11-1/3				
	11.05				
	F_t				

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: TOMMA DATE: 9 JULY 1977

Distance: 18 . 8 km., K_1 = 0.975 / I_a/I_{as} K_2 = 0.99 / Loop Factor K_3 = 1.00 (Tripod) / Vehicle Factor

BENCHMARK DATA

Freq. (kHz)	I_{as} (A)	E_a (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	282	34.3	275	34.0	33.0	4.3	176	0.0564	2.253
13.6	282	46.7	275	46.2	45.4	8.1	182	0.1073	3.108
11-1/3	290	39.6	283	39.2	38.3	5.7	179	0.0719	2.544

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: TOMMA DATE: 15 JULY 1977

Distance: 18 . 8 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 0.99 (Loop Factor) K_3 = 1.00 (Tripod) (Vehicle Factor)

BENCH MARK DATA

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	286	34.3	279	34.0	33.0	4.3	173	0.0548	2.222

DATA SHEET 6

RADIO FIELD INTENSITY CALCULATIONS

BENCHMARK DATA

OMEGA STATION: NORWAY SITE NUMBER: HESTMANNEN DATE: 9, 14 & 15 JULY 1977

Distance: 18 .25 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{0.99}{\text{Loop Factor}}$ $K_3 = \frac{1.00 \text{ (Tripod)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
ANTENNA AT LOWEST POINT, -22 SHEAVE TURNS.									
10.2	308	31.9	300	31.6	30.6	3.5	145	0.0384	1.859
11-1/3	309	35.4	301	35.0	34.1	4.3	145	0.0475	2.069
13.6	308	44.0	300	43.6	42.8	6.8	152	0.0751	2.600
ANTENNA AT HIGHEST POINT, 1973 HEIGHT.									
10.2	277	36.6	270	36.2	35.1	4.6	185	0.0625	2.372
11-1/3	270	39.0	263	38.6	37.6	5.2	183	0.0756	2.608
13.6	270	49.1	263	48.6	47.7	8.4	194	0.1217	3.309
ANTENNA AT MID-POINT, 1975 HEIGHT.									
10.2	282	33.0	275	32.7	31.6	3.7	164	0.0490	2.100
11-1/3	289	36.6	282	36.2	35.3	4.6	161	0.0581	2.287
11-1/3	290	36.5	283	36.1	35.2	4.6	160	0.0574	2.273
13.6	284	45.0	277	44.6	43.7	7.1	169	0.0924	2.883
13.6	283	44.9	276	44.5	43.7	7.1	169	0.0926	2.887

RADIO FIELD INTENSITY

OMEGA STATION: NORWAY SITE NUMBER: Tranna (B.M.) DATE: 15 July 1971

Distance: 18 . 8 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 0.99 (Loop Factor) K_3 = 1.00 (TRIPOD) (Vehicle Factor)

MEASUREMENTS WHILE LOWERING ANTENNA SPANS.

CALCULATIONS

	Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	H_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)	Sheave turns	
	10.2	287	38.5	280	38.1	37.0	5.4	194	0.0686	2.485	0	#
	11-1/3	282	42.6	275	42.2	41.2	6.7	198	0.0880	2.814	0	
	13.6	278	51.5	271	51.0	50.1	9.9	203	0.1343	3.476	0	
	10.2	288	37.9	281	37.5	36.4	5.2	190	0.0660	2.438	-2	
	10.2	286	37.0	279	36.6	35.5	5.0	187	0.0638	2.396	-4	
	10.2	286	36.3	279	35.9	34.9	4.8	183	0.0614	2.351	-6	
	10.2	286	35.9	279	35.5	34.5	4.7	181	0.0601	2.325	-8	
	10.2	291	35.7	284	35.3	34.3	4.6	177	0.0574	2.272	-10	
*	10.2	286	34.3	279	34.0	33.0	4.3	173	0.0548	2.222	-12	*
	10.2	279	32.8	272	32.5	31.5	3.9	170	0.0527	2.178	-14	
	10.2	296	34.3	289	34.0	33.0	4.3	167	0.0512	2.146	-16	
	10.2	295	33.7	288	33.4	32.4	4.1	165	0.0498	2.116	-18	
	10.2	280	31.1	273	30.8	29.9	3.5	161	0.0470	2.057	-20	
	10.2	287	31.6	280	31.3	30.4	3.6	159	0.0462	2.040	-22	
	11-1/3	310	38.3	302	37.9	37.0	5.4	162	0.0588	2.301	-22	
	13.6	286	43.0	279	42.6	41.8	6.9	165	0.0884	2.821	-22	
	# =	1973	HT.		* =	1995	HT.					

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

HELICOPTER CAL.

OMEGA STATION: NORWAY SITE NUMBER: TOMMA DATE: 27 JULY 1977

Distance: 18 . 8 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 0.99 (Loop Factor) K_3 = 1.00 (Tripod) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	267	29.2	260	28.9	28.1	3.1	158	0.0456	2.026
13.6	267	40.4	260	40.0	39.3	6.1	166	0.0896	2.839
11-1/3	268	32.8	261	32.5	31.7	3.9	160	0.[illegible]7	2.280
11.05	267	32.2	260	31.9	31.1	3.8	162	0.0559	2.244

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: I-1 DATE: 30 JULY 1977

Distance: 18 . 25 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	263	37.9	256	40.9	39.6	5.8	220	0.0885	2.822
13.6	265	50.2	258	54.2	53.2	10.5	220	0.1571	3.761
11-1/3	265	39.3	258	42.4	41.4	6.3	205	0.0948	2.921

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: I-2 DATE: 30 JULY 1977

Distance: 21.6 km., K_1 = 0.975 / I_a/I_{as} K_2 = 1.00 / Loop Factor K_3 = 1.08 (Helo.) / Vehicle Factor

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	263	30.5	256	32.9	32.2	5.4	212	0.0817	2.712
13.6	261	41.6	254	44.9	44.3	10.2	220	0.1574	3.764
11-1/3	261	32.4	254	35.0	34.3	6.1	205	0.0944	2.915

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: I-3 DATE: 30 JULY 1977

Distance: 27.1 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	264	23.4	257	25.4	25.0	5.1	205	0.0770	2.633
13.6	262	32.9	255	35.7	35.4	10.2	220	0.1565	3.753
11-1/3	262	25.4	255	27.5	27.2	6.0	203	0.0926	2.887

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: I-4 DATE: 30 JULY 1977

Distance: 36.2 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	264	16.6	257	18.0	17.9	4.6	196	0.0700	2.511
13.6	262	23.8	255	25.8	25.7	9.6	213	0.1472	3.640
11-1/3	262	19.8	255	21.5	21.3	6.6	212	0.1015	3.022

OMEGA STATION: NORWAY SITE NUMBER: I-5 DATE: 30 JULY 1977

Distance: 41.9 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	262	14.5	255	15.7	15.6	4.8	200	0.0730	2.563
13.6	262	19.3	255	20.9	20.9	8.5	200	0.1300	3.421
11-1/3	262	16.4	255	17.8	17.7	6.1	204	0.0936	2.902

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: I-6 DATE: 30 JULY 1977

Distance: 48.7 km., K_1 = 0.975 / I_a/I_{as} K_2 = 1.00 / Loop Factor K_3 = 1.08 (Helo.) / Vehicle Factor

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	262	11.4	255	12.4	12.3	4.0	183	0.0612	2.346
13.6	262	16.5	255	17.9	17.8	8.4	199	0.1286	3.402
11-1/3	262	12.8	255	13.9	13.8	5.0	185	0.0772	2.636

OMEGA STATION: NORWAY SITE NUMBER: I-6 DATE: 30 JULY 1977

Distance: 48.2 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

HELICOPTER ON THE GROUND.

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	263	8.9	256	9.7	9.6	2.4	142	0.0370	1.825
13.6	262	12.9	255	14.0	14.0	5.1	156	0.0786	2.660
11-1/3	263	10.0	256	10.8	10.8	3.1	144	0.0468	2.052

DS 6-12

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: I- 6 DATE: 30 JULY 1977

Distance: 48 . 7 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 0.99 (Loop Factor) K_3 = 1.00 (Tripod) (Vehicle Factor)

OUTSIDE LOOP - ON TRIPOD - 50 FT. FROM HELO.

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	263	9.6	256	9.5	9.5	2.4	140	0.0359	1.797
13.6	263	13.8	256	13.7	13.6	4.9	151	0.0744	2.588
11-1/3	263	11.2	256	11.1	11.0	3.2	147	0.0489	2.098

OMEGA STATION: NORWAY SITE NUMBER: II - 1 DATE: 29 JULY 1977

Distance: 18 . 25 km., K_1 = 0.975 / I_a/I_{as} K_2 = 1.00 / Loop Factor K_3 = 1.08 (Helo.) / Vehicle Factor

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	n_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	271	37.7	264	40.7	39.4	5.8	213	0.0825	2.724
13.6	271	52.9	264	57.1	56.1	11.6	227	0.1668	3.875
11-1/3	271	41.6	264	44.9	43.8	7.1	212	0.1016	3.024
11.05	271	40.7	264	44.0	42.8	6.8	213	0.0970	2.954

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

DATA SHEET 6

RADIO FIELD INTENSITY CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: II - 2 DATE: 29 JULY 1977

Distance: 37 . 5 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	16.7	263	18.0	17.9	5.0	199	0.0722	2.549

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: II-3 DATE: 29 JULY 1977

Distance: 49 . 7 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	271	9.1	264	9.8	9.8	2.6	144	0.0376	1.840
13.6	271	14.6	264	15.8	15.7	6.8	173	0.0973	2.959
11-1/3	271	11.6	264	12.5	12.5	4.3	165	0.0613	2.348
11.05	271	11.3	264	12.2	12.2	4.1	165	0.0581	2.287

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: III - 1 DATE: 29 JULY 1977

Distance: 21 . 1 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	32.7	263	35.3	34.5	5.9	216	0.0849	2.763
13.6	271	45.1	264	48.7	48.0	11.4	225	0.1636	3.837
11-1/3	271	36.8	264	39.7	39.0	7.5	219	0.1076	3.112
11.05	270	35.6	263	38.4	37.7	7.0	217	0.1013	3.019

OMEGA STATION: NORWAY SITE NUMBER: III - 2 DATE: 29 JULY 1977

Distance: 51 . 1 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	12.6	263	13.6	13.6	5.3	205	0.0769	2.630
13.6	270	17.4	263	18.8	18.7	10.2	213	0.1472	3.639
11-1/3	271	15.4	264	16.6	16.6	8.0	225	0.1142	3.206
11.05	270	14.8	263	16.0	15.9	7.4	223	0.1062	3.092
13.6	270	18.4	263	19.9	19.8	11.4	225	0.1646	3.848

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: IV -1 DATE: 27 JULY 1977

Distance: 27 . 8 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	267	24.2	260	26.1	25.8	5.7	215	0.0842	2.752
13.6	267	32.4	260	35.0	34.7	10.3	217	0.1527	3.707
11-1/3	268	26.4	261	28.5	28.2	6.8	211	0.0999	2.999
11.05	267	26.1	260	28.2	27.9	6.7	214	0.0983	2.974
10.2	267	23.7	260	25.6	25.2	5.5	210	0.0807	2.695

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: IV - 2 DATE: 27 JULY 1977

Distance: 48 . 0 km., K_1 = 0.975 / I_a/I_{as} K_2 = 1.00 / Loop Factor K_3 = 1.08 (Helo.) / Vehicle Factor

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	267	15.1	260	16.3	16.2	6.7	233	0.0995	2.993
13.6	267	19.2	260	20.7	20.7	10.9	223	0.1616	3.813
11-1/3	268	15.3	261	16.5	16.5	6.9	212	0.1016	3.024
11.05	267	14.6	260	15.8	15.7	6.3	209	0.0932	2.896

OMEGA STATION: NORWAY SITE NUMBER: V-1 DATE: 1 AUG 1977

Distance: 9.4 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	Rr (Ohm)	Erd/Ia (Units)
10.2	270	65.0	263	70.2	62.8	3.9	175	0.0559	2.244
13.6	270	75.0	263	81.0	75.9	5.7	159	0.0816	2.709
11-1/3	270	72.4	263	78.2	71.4	5.0	179	0.0721	2.548
11.05	270	69.1	263	74.6	67.8	4.5	174	0.0651	2.421

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-2A DATE: 1 AUG 1977

Distance: 13 . 1 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	50.8	263	54.9	51.7	5.1	201	0.0734	2.571

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-2B DATE: 1 AUG 1977

Distance: 15 . 0 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
13.6	270	63.1	263	68.1	66.4	11.0	221	0.1588	3.781

DATA SHEET 6

RADIO FIELD INTENSITY CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-2C DATE: 1 AUG 1977

Distance: 13 . 8 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11-1/3	270	56.2	263	60.7	58.1	7.1	214	0.1029	3.043

DATA SHEET 6

RADIO FIELD INTENSITY CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-2D DATE: 1 AUG 1977

Distance: 14.0 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11.05	270	55.2	263	59.6	57.0	7.1	218	0.1020	3.029

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-2E DATE: 1 AUG 1977

Distance: 12 . 9 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	269	54.1	262	58.4	54.9	5.6	211	0.0811	2.701

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-3A DATE: 1 AUG 1977

Distance: 19.4 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	30.1	263	32.5	31.6	4.2	182	0.0603	2.329
13.6	270	41.1	263	44.4	43.7	8.0	188	0.1151	3.219
11-1/3	270	33.5	263	36.2	35.4	5.2	183	0.0754	2.606
11.05	270	31.4	263	33.9	33.1	4.6	176	0.0661	2.439

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-3 B DATE: 1 AUG 1977

Distance: 20 . 2 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	269	29.5	262	31.9	31.0	4.4	186	0.0635	2.390

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-4A DATE: 1 AUG 1977

Distance: 30 . 5 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	20.2	263	21.8	21.6	4.8	195	0.0694	2.498

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-4B DATE: 1 AUG 1977

Distance: 29.9 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
13.6	270	28.4	263	30.7	30.5	9.2	202	0.1330	3.460

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-4C DATE: 1 AUG 1977

Distance: 29 . 7 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11-1/3	270	21.9	263	23.7	23.4	5.4	186	0.0776	2.642

OMEGA STATION: NORWAY SITE NUMBER: V-4D DATE: 1 AUG 1977

Distance: 30.5 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11.05	270	22.2	263	24.0	23.7	5.8	198	0.0841	2.750

DATA SHEET 6

RADIO FIELD INTENSITY CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-4E DATE: 1 AUG 1977

Distance: 29 . 5 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11.05	270	22.4	263	24.2	23.9	5.5	193	0.0799	2.682

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-4F DATE: 1 AUG 1977

Distance: 31 . 0 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.03 (NOSE AWAY) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11.05	270	25.3	263	26.1	25.8	7.1	219	0.1026	3.039

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-4G DATE: 1 AUG 1977

Distance: 30 . 8 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	269	19.1	262	20.6	20.4	4.4	187	0.0637	2.395

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-5A DATE: 1 AUG 1977

Distance: 33.4 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	18.6	263	20.1	19.9	4.9	197	0.0708	2.524

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-5B DATE: 1 AUG 1977

Distance: 33 . 9 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
13.6	270	23.1	263	24.9	24.8	7.9	187	0.1135	3.196

OMEGA STATION: NORWAY SITE NUMBER: V-5C DATE: 1 AUG 1977

Distance: 33.4 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11-1/3	270	20.4	263	22.0	21.9	5.9	195	0.0855	2.773

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-5 D DATE: 1 AUG 1977

Distance: 34 . 4 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
11.05	270	19.1	263	20.6	20.5	5.5	193	0.0795	2.675

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: V-5E DATE: 1 AUG 1977

Distance: 34.9 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

HELICOPTER ON GROUND - MOUNTAIN TOP

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	19.5	263	21.1	20.9	5.9	216	0.0851	2.767
13.6	270	26.3	263	28.4	28.3	10.8	219	0.1560	3.747
11-1/3	270	22.0	263	23.8	23.6	7.5	220	0.1087	3.127
11.05	270	21.9	263	23.7	23.5	7.5	224	0.1076	3.112

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: VII - 1 DATE: 1 AUG 1977

Distance: 21 . 8 km., K_1 = 0.975 / I_a/I_{as} K_2 = 1.00 / Loop Factor K_3 = 1.08 (Helo.) / Vehicle Factor

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	he (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	31.3	263	33.8	33.1	5.8	214	0.0832	2.737
13.6	271	41.1	264	44.4	43.8	10.1	212	0.1453	3.616
11-1/3	270	33.5	263	36.2	35.5	6.7	207	0.0961	2.942
11.05	270	31.3	263	33.8	33.2	5.8	198	0.0838	2.746

OMEGA STATION: NORWAY SITE NUMBER: VI - 1 DATE: 1 AUG 1977

Distance: 21 . 8 km., K_1 = 0.975 (I_a/I_{as}) K_2 = 1.00 (Loop Factor) K_3 = 1.08 (Helo.) (Vehicle Factor)

HELICOPTER ON GROUND - LOW ISLAND

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	270	25.6	263	27.6	27.0	3.9	175	0.0557	2.239
13.6	270	33.9	263	36.6	36.1	6.9	175	0.0996	2.993
11-1/3	270	27.3	263	29.5	28.9	4.4	168	0.0639	2.397
11.05	270	26.8	263	28.9	28.4	4.3	169	0.0614	2.351

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: VII - 1 DATE: 1 AUG 1977

Distance: 21 . 8 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{0.99}{\text{Loop Factor}}$ $K_3 = \frac{1.00 \text{ (Tripod)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_q (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	269	28.2	262	27.9	27.3	3.9	177	0.0572	2.269
13.6	269	37.4	262	37.0	36.6	7.1	178	0.1026	3.038
11-1/3	271	30.4	264	30.1	29.5	4.6	171	0.0660	2.438
11.05	270	29.8	263	29.5	28.9	4.4	173	0.0638	2.396

OMEGA STATION: NORWAY SITE NUMBER: VII-2 DATE: 1 AUG 1977

Distance: 31.1 km., K_1 = 0.975 / I_a/I_{as} K_2 = 1.00 / Loop Factor K_3 = 1.08 (Helo.) / Vehicle Factor

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	271	22.3	264	24.1	23.8	6.1	219	0.0873	2.803
13.6	271	30.7	264	33.2	32.9	11.7	227	0.1671	3.878
11-1/3	271	24.4	264	26.4	26.1	7.3	216	0.1050	3.074
11.05	271	24.7	264	26.7	26.4	7.5	224	0.1075	3.110

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

DATA SHEET 6

RADIO FIELD INTENSITY

CALCULATIONS

OMEGA STATION: NORWAY SITE NUMBER: VI - 3 DATE: 1 AUG 1977

Distance: 42 . 9 km., $K_1 = \frac{0.975}{I_a/I_{as}}$ $K_2 = \frac{1.00}{\text{Loop Factor}}$ $K_3 = \frac{1.08 \text{ (Helo.)}}{\text{Vehicle Factor}}$

Freq. (kHz)	I_{as} (A)	E_g (mV)	I_a (A)	E_m (mV/m)	E_r (mV/m)	P_r (kW)	h_e (m)	R_r (Ohm)	E_{rd}/I_a (Units)
10.2	271	15.3	264	16.5	16.4	5.5	208	0.0790	2.667
13.6	271	20.9	264	22.6	22.5	10.3	214	0.1482	3.653
11-1/3	271	17.7	264	19.1	19.0	7.4	217	0.1060	3.089
11.05	271	16.6	264	17.9	17.8	6.5	209	0.0932	2.896

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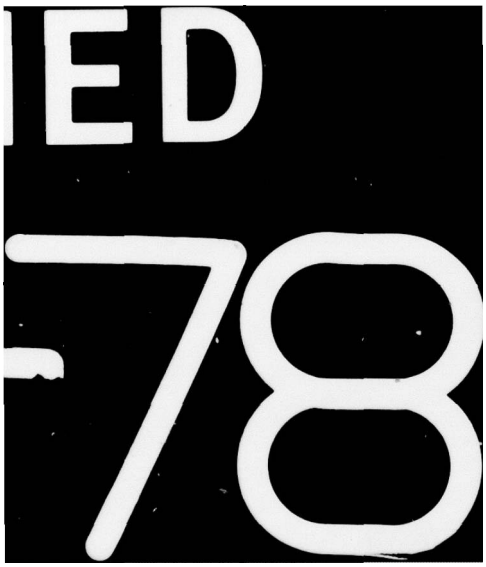
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